

AMENDMENTS TO THE CLAIMS

Please amend claims 7, 13, 19, 157, 158, and 159-162. Please add new claim 163. Please also cancel claims 11, 12, 14, 33, 142, 155, and 156 without prejudice or disclaimer. Deletions appear in ~~strike-through font~~, and additions are underlined. This listing of claims will replace all prior versions and listings of claims in the application.

Complete listing of the claims

Claims 1-6 (Canceled)

7. (Currently amended) A method of analyzing patterns, comprising:
receiving a first diffraction pattern;
receiving a second diffraction pattern;
receiving a third diffraction pattern;
detecting the characteristic peaks of the first diffraction pattern;
detecting the characteristic peaks of the second diffraction pattern;
detecting the characteristic peaks of the third diffraction pattern;
determining a first similarity between the first and the second diffraction patterns
based on the characteristic peaks of the first and the second diffraction
patterns;
determining a second similarity between the first and the third diffraction patterns
based on the characteristic peaks of the first and the third diffraction patterns;
determining a third similarity between the second and the third diffraction
patterns based on the characteristic peaks of the second and the third
diffraction patterns;
performing hierarchical cluster analysis on the first, the second, and the third
diffraction pattern based on the determined first, second, and third similarity;
and
displaying the results of the hierarchical cluster analysis;
~~The method of claims 142 or 13, wherein the characteristic peaks are determined~~
detected by computing the variance of the diffraction patterns.

Claims 8-12 (Canceled)

13. (Currently amended) A method of analyzing patterns, comprising:
receiving a first diffraction pattern;
receiving a second diffraction pattern;
receiving a third diffraction pattern;
detecting the characteristic peaks of the first diffraction pattern;
detecting the characteristic peaks of the second diffraction pattern;
detecting the characteristic peaks of the third diffraction pattern;
determining a first similarity between the first and the second diffraction patterns
based on the characteristic peaks of the first and the second diffraction
patterns;
determining a second similarity between the first and the third diffraction patterns
based on the characteristic peaks of the first and the third diffraction patterns;
determining a third similarity between the second and the third diffraction
patterns based on the characteristic peaks of the second and the third
diffraction patterns;
performing hierarchical cluster analysis on the first, the second, and the third
diffraction pattern based on the determined first, the second, and the third
similarity; and
displaying the results of the hierarchical cluster analysis;
~~The method of claim 142, wherein the characteristic peaks are detected by a~~
~~method comprising:~~
~~determining the peaks of the diffraction patterns; and~~
~~assigning probability scores to the determined peaks of the diffraction pattern.~~

Claim 14 (Canceled)

15. (Previously presented) The method of claims 157 or 158, wherein discretely allocating the characteristic peaks comprises discretely allocating the

characteristic peaks into a first, a second, a third, and a fourth group based on the assigned probability scores.

16. (Previously presented) The method of claim 15, wherein determining the similarities based on the characteristic peaks comprises comparing one or more characteristic peaks in the first diffraction pattern with one or more characteristic peaks in the second diffraction pattern.
17. (Previously presented) The method of claim 16, wherein comparing one or more characteristic peaks in the first diffraction pattern with one or more characteristic peaks in the second diffraction pattern further comprises:
for each characteristic peak in the first group of the first diffraction pattern, comparing the characteristic peak in the first group of the first diffraction pattern with the characteristic peaks in the first, second, or third group of the second diffraction pattern and penalizing a matching score if the characteristic peak in the first group of the first diffraction pattern is not found in the first, second, or third group of the second diffraction pattern.
18. (Previously presented) The method of claim 17, wherein comparing one or more characteristic peaks in the first diffraction pattern with one or more characteristic peaks in the second diffraction pattern further comprises:
for each characteristic peak in the second group of the first diffraction pattern, comparing the characteristic peak in the second group of the first diffraction pattern with the characteristic peaks in the first, second, third, or fourth group of the second diffraction pattern and penalizing a matching score if the characteristic peak in the first group of the first diffraction pattern is not found in the first, second, third, or fourth group of the second diffraction pattern.
19. (Currently amended) The method of claim 16, wherein determining the similarities based on the characteristic peaks further comprises matching the diffraction patterns based on the characteristic peaks, wherein matching the diffraction patterns based on the characteristic peaks further comprises

comparing one or more characteristic peaks in ~~the second~~ a diffraction pattern
with one or more characteristic peaks in ~~the first~~ another diffraction pattern.

Claims 20-34 (Canceled)

35. (Original) The method of claim 16, wherein comparing the peaks further comprises matching a split peak with a peak having a shoulder as an acceptable match.

Claims 36-156 (Canceled)

157. (Currently amended) A method of analyzing patterns, comprising:
receiving a first diffraction pattern;
receiving a second diffraction pattern;
detecting the characteristic peaks of the first diffraction pattern;
detecting the characteristic peaks of the second diffraction pattern;
determining a similarity between the first and the second diffraction patterns
based on the characteristic peaks of the first and the second diffraction
patterns;
performing hierarchical cluster analysis on the first and second diffraction pattern
based on the determined similarity; and
displaying the results of the hierarchical cluster analysis;
~~The method of claim 156,~~ wherein the characteristic peaks are detected by a
method comprising:
 determining the characteristic peaks of the diffraction patterns; and
 assigning probability scores to the determined characteristic peaks of the
 diffraction pattern; and
wherein the method of analyzing patterns further comprises discretely allocating
the ~~determined~~ detected characteristic peaks into one or more groups based on
the assigned probability scores.

158. (Currently amended) The method of claim 157, wherein discretely allocating the ~~determined~~ detected characteristic peaks comprises discretely allocating the determined characteristic peaks into ~~more than one group~~ one or more groups based on the assigned probability scores.
159. (Currently amended) The method of claims 13 or 157 further comprising classifying the characteristic peaks by discretely allocating the ~~determined~~ detected characteristic peaks into one or more groups based on the assigned probability scores.
160. (Currently amended) A method of analyzing patterns, comprising:
receiving a first diffraction pattern;
receiving a second diffraction pattern;
receiving a third diffraction pattern;
detecting the characteristic peaks of the first diffraction pattern;
detecting the characteristic peaks of the second diffraction pattern;
detecting the characteristic peaks of the third diffraction pattern;
wherein the characteristic peaks of the first, second, and third diffraction patterns are detected by determining the peaks of the first, second, and third diffraction patterns and assigning probability scores to the determined peaks of the first, second, and third diffraction patterns;
determining a first similarity between the first and the second diffraction patterns based on the characteristic peaks of the first and the second diffraction patterns;
determining a second similarity between the first and the third diffraction patterns based on the characteristic peaks of the first and the third diffraction patterns;
determining a third similarity between the second and the third diffraction patterns based on the characteristic peaks of the second and the third diffraction patterns; and

performing hierarchical cluster analysis on the first, the second, and the third diffraction pattern based on the determined first, ~~the second, and the third~~ similarity; and
displaying the ~~relationship among the received diffraction patterns~~ results of the hierarchical cluster analysis.

161. (Currently amended) The method of claims 13, ~~142~~ or 160 wherein the ~~relationship among the received diffraction patterns is~~ results of the hierarchical cluster analysis are displayed as a dendrogram.
162. (Currently amended) The method of claim 159 wherein the ~~relationship among the received diffraction patterns is~~ results of the hierarchical cluster analysis are displayed as a dendrogram.
163. (New) The method of claim 13, wherein the characteristic peaks are detected by computing the variance of the diffraction patterns.